

I CLAIM:

1. A power cable assembly for use in a water-cooled welding apparatus for conveying power from a welding machine to a welding torch and cooling water from the torch to a circulator reservoir, said cable assembly comprising:

a flexible electrical conductor formed of a plurality of twisted, braided or bunched wires;

a layer of flexible material encasing said conductor and defining a plurality of projections extending radially therefrom; and

an outer flexible conduit disposed about said conductor and said encasing layer, said projections spacing said conduit from said conductor so as to define a water-flow path extending along said conduit and surrounding said conductor for the effective dissipation of heat in said conductor.

2. The power cable assembly of claim 1, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

3. The power cable assembly of claim 1, wherein said radial projections are integrally formed with said layer of flexible material.

4. The power cable assembly of claim 3, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

5. The power cable assembly of claim 1, wherein said projections abut said flexible conduit so as to position said conductor in substantial axial alignment with said conduit so as to provide a substantially uniform water flow about said conductor.

6. The power cable assembly of claim 5, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

7. The power cable assembly of claim 6, wherein said radial projections are integrally formed with said layer of flexible material.

8. The power cable assembly of claim 7, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

9. A power cable assembly for use in a water-cooled welding apparatus for conveying power from a welding machine to a welding torch and cooling water from the torch to a circulatory reservoir, said cable assembly comprising:

an outer flexible conduit;

a flexible electrical conductor formed of a plurality of twisted, braided or bunched wires and disposed within said conduit;

a layer of flexible material encasing said conductor, said encasing layer having a thickness within the range of about .008 - .015 inches;

a plurality of projections extending radially from said encasing layer and spacing said conductor and said encasing layer from said flexible conduit so as to define a water flow path within said conduit extending along said conduit and surrounding said conductor for the effective dissipation of heat in said conductor; and

a pair of end fittings for securing said power cable assembly between the welding torch and welding machine in fluid and electrical communication therewith.

10. The power cable assembly of claim 9, wherein said radial projections are integrally formed with said layer of flexible material encasing said conductor.

11. A power cable assembly for use in an air-cooled welding apparatus for conveying power and inert gas to a welding torch, said cable assembly comprising:

a flexible electrical conductor formed of a plurality of twisted, braided or bunched wires;

a layer of flexible material encasing said conductor and defining a plurality of projections extending radially therefrom; and

an outer flexible conduit disposed about said conductor and said encasing layer, said projections spacing said conduit from said conductor so as to define a gas-flow path extending along said conduit and surrounding said conductor.

12. The power cable assembly of claim 11, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

13. The power cable assembly of claim 11, wherein said radial projections are integrally formed with said layer of flexible material.

14. The power cable assembly of claim 13, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

15. The power cable assembly of claim 11, wherein said projections abut said flexible conduit so as to position said conductor in substantial axial alignment with said conduit so as to provide a substantially uniform gas flow about said conductor.

16. The power cable assembly of claim 15, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

17. The power cable assembly of claim 16, wherein said radial projections are integrally formed with said layer of flexible material.

18. The power cable assembly of claim 17, wherein said layer of flexible material is a plastic material having a thickness within the range of about .008 - .015 inches.

19. A power cable assembly for use in an air-cooled welding apparatus for conveying power and inert gas from a welding machine to a welding torch, said cable assembly comprising:

an outer flexible conduit;

a flexible electrical conductor formed of a plurality of twisted, braided or bunched wires and disposed within said conduit;

a layer of flexible material encasing said conductor, said encasing layer having a thickness within the range of about .008 - .015 inches;

a plurality of projections extending radially from said encasing layer and spacing said conductor and said encasing layer from said flexible conduit so as to define a gas flow path within said conduit extending along said conduit and surrounding said conductor; and

a pair of end fittings for securing said power cable assembly between the welding torch and welding machine in fluid and electrical communication therewith.

20. The power cable assembly of claim 19 wherein said radial projections are integrally formed with said layer of flexible material encasing said conductor.

21. A power cable assembly adapted to be provided with end fittings for use in a water-cooled welding apparatus for conveying power from a welding machine to a welding torch and cooling water from the torch to a circulator reservoir or in an air-cooled welding apparatus for conveying power and inert gas from a welding machine to a welding torch, said cable assembly comprising:

an outer flexible conduit;

a flexible electrical conductor formed of a plurality of twisted, braided or bunched wires and disposed within said conduit;

a layer of flexible material encasing said conductor; and
a plurality of projections extending radially from said encasing layer and
spacing said conductor and said casing layer from said flexible conduit so as to
define a fluid flow path within said conduit extending along said conduit and
surrounding said conductor.

22. The power cable assembly of claim 21 wherein said radial
projections are integrally formed with said layer of flexible material.

23. The power cable assembly of claim 22 wherein said layer of flexible
material is a plastic material having a thickness within the range of about .008 -
.015 inches.

24. The power cable assembly of claim 21 wherein said radial
projections are integrally formed with said layer of flexible material and wherein
said layer of flexible material is a plastic material having a thickness within the
range of about .008 - .015 inches.